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AUDITORY MODALITY--RESEARCH AND PRACTICE.

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AUDITORY PERCEPTION, WHICH INCLUDES AUDITORY DISCRIMINATION AND AUDITORY MEMORY, IS DISCUSSED AND CLARIFIED IN RELATION TO LEARNING TO READ. THE FACTORS ARE DISCUSSED AS PERCEPTUAL QUALITIES WHICH ARE PART OF AN AURAL INPUT PATHWAY. INITIAL DATA FROM A LONGITUDINAL STUDY TO TEST THE EFFECT OF AUDITORY MEMORY AND DISCRIMINATION ON BEGINNING READING INSTRUCTION ARE REPORTED. SUBJECTS WERE 177 CHILDREN STUDIED OVER A 3-YEAR PERIOD--THE FIRST THROUGH THE THIRD GRADES. THE PARAMETERS TESTED INCLUDE ARTICULATION, INTELLIGENCE, AUDITORY AND VISUAL PERCEPTION, ORAL MOTOR MOVEMENT, VISUAL MOTOR ABILITY, AND READING READINESS. THE RESULTS SUGGEST THAT THERE IS A DEVELOPMENTAL PROGRESSION IN PERCEPTUAL ABILITIES. BOTH AUDITORY AND VISUAL PERCEPTION ARE SIGNIFICANTLY CORRELATED WITH MOST SUBTESTS OF THE READING ACHIEVEMENT TEST. THIS PAPER WAS PRESENTED AT THE INTERNATIONAL READING ASSOCIATION CONFERENCE (SEATTLE, MAY 4-6, 1967). (BK)

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Auditory Modality--Research and Practice

III Modality Approach to Reading Problems

Visual and Auditory Modalities

The purpose of this paper is to discuss and attempt to clarify the role of auditory perception, in particular the two functions of auditory discrimination and auditory memory in the process of learning to read. These functions, it is held here, are contributing factors of more than passing importance to the success or failure of children in a normal classroom and should be more widely recognized as such. A complete definition and interpretation of auditory perception and the role it plays in the modality concept of learning is discussed elsewhere in this publication (12). For present clarification, however, auditory discrimination is the ability to differentiate between closely related speech sounds. Auditory memory is the ability to retain and recall these sounds. An important aspect of this definition should be kept in mind. Auditory discrimination and auditory memory in the present framework are referred to as perceptual qualities and are regarded as a part of the sensory aural input pathway that contributes as a foundation

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for the conceptual level of learning, and not to sensation plus meaning as is sometimes found in other contexts.

In linguists' terminology, reading is decoding. It corresponds, in process, to listening. In fact, according to Carroll (2), there are two distinct stages specific to the early reading process. The child first learns that the symbols that appear on a printed page represent and correspond to his spoken language. In other words, the initial stage of reading consists of decoding orthography into previously learned speech patterns. The second stage involves comprehension through arousal of associations to effect a meaningful state derived from past verbal learning. The ability to discriminate fine differences in speech sounds, to retain and to recall them facilitates the phonological development in very young children, language acquisition and articulation accuracy. It follows a rather natural logic that these abilities would aid in the decoding--the translation of written material.

Since the early 1930's auditory discrimination and memory abilities have been the subject of much study relative to speech development as well as to reading. In some instances inter-correlations have been sought between the four factors. Such studies have revealed that auditory perceptual abilities are related to success in beginning reading. It is understood from these studies that 1) there is a consistent increase in sound discrimination ability with age; 2) children vary in the rate of development of both auditory discrimination and auditory memory; 3) the development of auditory discrimination and auditory memory has not reached fruition in some children until the ninth year; 4) the auditory measures are not in themselves predictors of success or failure in reading.

Wepman has studied auditory perception and the relation it holds to speech and reading in young children. He has drawn similar conclusions

from his studies as those cited above and has offered a detailed theoretical analysis pertaining to these conclusions (7, 8, 9, 10, 11, 12). In addition to those four points, the Wepman focus has been on the significant fact that whether children have a speech defect or not, those who have inadequate auditory discrimination are more likely to be poor readers than the total group. In discussing the implications of his research and the findings of others, Wepman argues that children should be studied as they reach school age to determine whether their auditory abilities have developed to the level that they can benefit from phonic instruction. Unless this is done, Wepman feels that it would be a continuing erroneous practice to approach all children as though they can learn equally well through the same modality. He suggested grouping of children according to modality ability for learning as determined by early assessment.

It is somewhat ironic that as long ago as 1935, Bond cited evidence from his inquiry into the same area that led him to a similar recommendation.

Even in light of the established features that are now known regarding auditory discrimination and memory and their relationship to reading ability, however, inquiry continues along the same line. It appears that these similar researches are not executed as replications of previous studies but as if further probing might produce insights that would strengthen the already known positive relationships and provide a more definite, less complex solution to the problem for those concerned with the teaching of reading. This type of solution to the problem has not been forthcoming, however, and it seems appropriate to explore the meaning of this situation. It is felt by this writer that auditory discrimination and memory are but one set of factors that may contribute to the success or failure of children in beginning reading instruction.

Virtually absent in the literature are longitudinal studies of normal populations and experimental populations which would put into better perspective the overall implications of the role of the auditory measures in learning to read, for that matter, in school achievement in general.

In an effort in part to address this particular issue we have conducted a longitudinal study of a normal school population. The study was begun in 1963. The children were initially tested upon entering first grade, then at the end of second grade and again upon completion of third grade. There were 177 children who were present for the entire three year period. The parameters of the overall study included articulation, intelligence, auditory and visual perception, oral motor movement, visual motor ability and reading readiness measured upon the completion of kindergarten to be compared with later achievement testing.

The specific tests that were used which pertain to this report were the Wepman Auditory Discrimination Test (7) and an experimental test for auditory memory using consonant-vowel nonsense syllables. Experimental tests for visual memory and discrimination that incorporate the use of geometric forms (6) were utilized and further refined. In addition, the Lorge-Thorndike Group Intelligence Tests (3) and the Metropolitan Readiness and Achievement Tests (4) for the appropriate grade levels were given.

Although the final report of this longitudinal study is as yet forthcoming, we have arrived at some interesting empirical corroboration for the theoretical considerations which have been previously discussed. Table 1, for example, shows the mean differences in auditory perceptual ability between scores at the first and the third grade levels. The *t* test shows that this difference is significant ($p < .01$). The same table also shows the mean differences in visual perceptual ability

between scores at the first and the third grade levels. These differences are also significant ($p < .01$). Thus the notion of a developmental progression--an improvement--in perceptual ability is again confirmed in the performances of this population in the first three years of school. It should be noted, too, that correlations of improvement in the auditory modality with improvement in the visual modality are low, which means that children who improve in one modality may or may not improve in the other. In other words, the study has shown that perceptual abilities develop significantly in the first three years of school in a normal population and that these abilities progress individually along lines of modality preference at differing rates in the same individual.

Turning now to another factor addressed by the present study, Table 2 shows the relationship between auditory perceptual ability at the beginning of first grade and school achievement, as measured by the Metropolitan Achievement Test subtests at the end of the third grade. Auditory perceptual abilities (discrimination and memory) are significantly correlated with every subtest of the achievement battery ($p < .01$). It can be seen then that auditory perceptual difficulties that exist at the beginning of schod may contribute somewhat to the level of school achievement for as long as three years. Table 3 shows the relationship of the visual perceptual abilities (discrimination and memory) at the beginning of grade 1 to the same subtests of the Metropolitan Achievement Test, measured at the end of grade 3. Both of these factors are significantly correlated with most of the subtests ($p < .01$). The exceptions are visual memory and the two subtests, Punctuation and Language Total ($p < .05$). Visual memory and language usage have no significant correlation. The effect of early perceptual difficulties on achievement beyond the third grade is not tested as yet. However a continuation of the present study is now in progress and should clarify this issue.

Conclusions

The findings of the present study support those theoretical considerations of the modality concept of learning to which it was addressed. That perception is a developing process in children into the early school years is not being argued. The emphasis here is twofold. First is the consideration of the effect that this phenomenon of development may have on the child as he enters first grade. Correlations such as the ones presented here that demonstrate significant relationships between first grade perceptual ability and third yeard achievement cannot be overlooked. The stage of development in the various modalities, the adequacy of this development to support the learning that is necessary in the early grades is of crucial importance to successful achievement in the early grades.

The second consideration concerns specific recommendations which seem appropriate in dealing with all children entering first grade. These recommendations follow the theoretical concepts mentioned earlier that are supported by the empirical findings presented here. In first, second, and third grades in any elementary school, most children learn the three "R's" by whatever methods are utilized. However, in every class will be a percentage of children who learn more slowly than do their peers. The complexity of the learning process does not allow full discussion here of all of the possible factors that go to make up the slow learner. However, it would appear from the results of the present study that one strong possibility contributing to this condition, one that can be assessed quite readily is the adequacy of the auditory perceptual ability of first graders. For the purposes of individual maximum potential education, ability grouping on the basis of modality preference as shown by the test results would seem in order.

REFERENCES

1. Bond, G. . The Auditory and Speech Characteristics of Poor Readers. Teachers College, Columbia University, Contributions to Education No. 657, New York, 1935.

2. Carroll, J.H. The analysis of reading instruction: perspectives from psychology and linguistics, in Theories of Learning and Instruction (Ed. Ernest R. Hilgard). Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago, University of Chicago Press, 1964.

3. Durost, W. (Ed.). Metropolitan Achievement Tests. New York, Harcourt, Brace & World, Inc., 1959.

4. Lorge, R. and Thorndike, R.L. The Lorge-Thorndike Intelligence Tests, Boston, Houghton Mifflin Company, 1954.

5. Morency, A., Wepman, J.W. and Weiner, P.S. Studies in speech: developmental articulation inaccuracy. Elementary School Journal, March 1967, 67, 329-337.

6. Weiner, P.S., Wepman, J.M. and Morency, A.S. A test of visual discrimination. Elementary School Journal, March 1965, 65, 330-337.

7. Wepman, J.M. Auditory Discrimination Test. Chicago, Language Research Associates, 1958.

8. Wepman, J.M. Auditory discrimination, speech and reading. Elementary School Journal, 1960, 60, 325-333.

9. Wepman, J.M. The interrelationship of hearing, speech and reading. The Reading Teacher, 1961, 14, 245-247.

10. Wepman, J.M. Dyslexia: its relationship to language acquisition and concept formation. In Reading Disability (Ed. J. Money), Baltimore, Johns Hopkins Press, 1962.

11. Wepman, J.M. The perceptual basis for learning. In Meeting Individual Differences (Ed. Robinson). Supplementary Education Monograph No. 94, Chicago, University of Chicago Press, 1964.

12. Wepman, J.M. The Modality Concept--Including a Statement of the Perceptual and Conceptual Levels of Learning. Proceedings of the International Reading Association, May 1967.

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Table 1

PERCEPTUAL MODALITY ACHIEVEMENT

Mean Differences Between Scores at First and Third Grade Levels

Test	N	Mean Score Difference (improvement)	Standard Error	t
Auditory Discrimination	172	3.436	0.412	8.34*
Auditory Memory	177	-.305	0.076	-4.01*
Visual Discrimination	177	2.424	0.130	18.65*
Visual Memory	177	2.797	0.150	18.65*

* Significant at .01 level

Correlations of Difference Scores of

Auditory and Visual Perceptual Achievement

	Auditory Discrimination	Auditory Memory	Visual Discrimination	Visual Memory
Auditory Discrimination	1.000			
Auditory Memory	-.026	1.000		
Visual Discrimination	.108	-.163	1.000	
Visual Memory	.010	.149	.197	1.000

Table 2

CORRELATION OF AUDITORY PERCEPTUAL ABILITY (FIRST YEAR)

AND SCHOOL ACHIEVEMENT (THIRD YEAR)

N = 177

	First Grade Scores	
	Auditory Discrimination	Auditory Memory
Metropolitan Third Grade Achievement		
Word Knowledge	.348**	.237**
Word Discrimination	.274**	.313**
Reading	.235**	.274**
Spelling	.283**	.304**
Language Usage	.239**	.271**
Punctuation	.305**	.289**
Language Total	.306**	.312**
Arithmetic, Computation	.286**	.213**
Arithmetic, Problem Solving	.291**	.246**

** Significant at .01 level

Table 3

VISUAL PERCEPTUAL FACTORS CORRELATED WITH SCHOOL ACHIEVEMENT

N = 177

	First Grade Scores	
	Visual Discrimination	Visual Memory
Metropolitan Third Grade Achievement		
Word Knowledge	.246**	.240**
Word Discrimination	.238**	.267**
Reading	.244**	.237**
Spelling	.244**	.270**
Language Usage	.205**	.132
Punctuation	.274**	.199**
Language Total	.269**	.190*
Arithmetic, Computation	.231**	.214**
Arithmetic, Problem Solving	.264**	.256**

* Significant at .05 level

** Significant at .01 level